

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2006-
FOR
CALPINE SISKIYOU GEOTHERMAL PARTNERS, L.P., AND
CPN TELEPHONE FLAT, INC., AND
U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE AND
U.S. DEPARTMENT OF INTERIOR, BUREAU OF LAND MANAGEMENT
GLASS MOUNTAIN UNIT GEOTHERMAL
EXPLORATION AND DEVELOPMENT PROJECTS
SISKIYOU COUNTY

This Monitoring and Reporting Program describes requirements for notification of construction activities, geothermal fluid monitoring, sump monitoring, surface and ground water monitoring. This Monitoring and Reporting Program is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this Monitoring and Reporting Program unless revised by the Executive Officer.

NOTIFICATION

PRIOR TO CONSTRUCTION

The Discharger shall submit a notice, in writing, to the Central Valley Regional Water Quality Control Board (Central Valley Water Board) at least seven days prior to any construction associated with drilling site preparation, well drilling, and road construction. The notice shall include:

1. Proposed construction dates
2. Location of the facilities
3. Description of the facilities
4. Method of construction
5. Proposed location of ultimate disposal of drill cuttings and geothermal fluids

CERTIFICATION PRIOR TO DISCHARGE

The Discharger shall submit a written certification to the Regional Board after construction or reconstruction of a cuttings sump or geothermal fluid sump and prior to any discharge. The certification shall include the following information:

1. Permeability of the disposal sump liner
2. Thickness of the disposal sump liner

PROGRESS REPORTS

The Discharger shall notify the Central Valley Water Board, in writing no later than five days after the following events:

1. First waste discharge to a cuttings or geothermal fluid sump
2. Completion of each well drilled within the lease area
3. Completion of waste discharge to a cuttings or geothermal fluid sump
4. Completion of cuttings or geothermal fluid sump closing activities

WASTE TRANSFERS

The Discharger shall record all transfers of waste from cuttings or geothermal fluid sumps. The record shall include the type and amount of waste removed and the location of the new disposal site. This information shall be submitted to the Central Valley Water Board monthly.

CIRCULATION LOSS*¹

The Discharger shall immediately notify the Central Valley Board of any circulation loss during the construction of a well at depths less than 1300 feet. The notice shall include:

1. Location of the well
2. Well depth at the circulation loss
3. Amount of drilling fluid lost
4. Method of correction

GEOTHERMAL FLUID MONITORING

The Discharger shall record the volume of geothermal fluids produced and discharged to the lined geothermal fluid sumps. A representative sample of geothermal fluids shall be obtained from each well flowed. The well sample should be taken immediately after separation of the steam has taken place. The sample should be taken toward the end of the testing period so as to give as representative a sample as possible. Fluid purged from geothermal wells, which have had materials such as hydrochloric and hydrofluoric acids injected for the purpose of formation stimulation, shall be sampled within eight hours of being pumped from the well, and analyzed for the constituents listed in the table. The sample results shall be reported monthly during discharge to the sumps. The samples shall be analyzed for the following:

¹ Terms indicated with an asterisk (*) are defined in the Glossary of Terms in the Information Sheet.

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Constituents	Units
pH	pH Units
Specific Conductivity	µmhos/cm
Total Dissolved Solids	mg/L
Sulfide	mg/L
General Minerals ¹	mg/L
Boron	µg/L
Cobalt	µg/L
Iron	µg/L
Molybdenum	µg/L
Manganese	µg/L
Vanadium	µg/L
Priority Pollutant Metals ²	µg/L
Mercury ³	ng/L

¹ General Minerals shall include: Anions – F, Cl, NO₂, NO₃, PO₄, and SO₄ Cations – NH₄, K, Ca, Mg, Na, HCO₃, CO₃, and Al.

² Priority pollutant metals include: Antimony, arsenic, beryllium, cadmium, total chromium, chromium VI, copper, lead, nickel, selenium, silver, thallium, and zinc.

³ Mercury analyses shall be conducted using the ultraclean protocol, CVAA-EPA Method 1631.

GEOTHERMAL FLUID AND CUTTINGS SUMPS MONITORING

The Discharger shall record the volume of waste (liquid for geothermal fluids sumps, solid for cuttings sumps) discharged to the lined and unlined cuttings sumps and geothermal fluid sumps. If spills of petroleum, acids or other hazardous materials occur which have been contained in the sumps, the material contained and the volume of the spill shall be recorded. Any such spill shall be reported to the Central Valley Water Board within 24 hours. Monitoring for individual geothermal fluids sumps receiving discharge from a well test or containing geothermal fluid shall include the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Freeboard	feet	Visual	Daily

Within 30 days after completion of well testing at each site, the Discharger shall collect a representative sample of the solids which have collected in the bottom of the geothermal fluids sump and analyze for priority pollutant metals as listed in the table above for geothermal fluid monitoring. Mercury shall be collected and analyzed by the ultraclean protocol, (CVAA-EPA Method 1631). A representative composite sample of drill cuttings from well drilling will be taken from the lined cuttings sumps when drilling is complete or before **1 November** in any year in which cuttings have been added to the sump, and analyzed to confirm they are non hazardous and non designated. A representative composite sample of drill cuttings from temperature gradient hole* drilling will be taken from the unlined cuttings sumps when drilling is complete or before **1 November** in any year in which cuttings have been added to the sump, and analyzed to confirm they are non hazardous and non designated. a representative composite sample of solids from the bottom of lined geothermal fluid sumps will be taken at the cessation of geothermal fluid additions to the sump or before **1 November** in any year in which geothermal fluid has been added to the sump, and analyzed to confirm they are non hazardous and non designated.

SURFACE WATER MONITORING

The Discharger shall continue to sample surface waters as specified in the “Medicine Lake Comprehensive Hydrology Monitoring Plan” as shown in Attachment E, which is incorporated into this Monitoring and Reporting Program by reference. Results of the monitoring shall be submitted twice annually as specified in the Monitoring Plan. Any changes in the Monitoring Plan as specified by the Bureau of Land Management (BLM) shall be reported.

GROUNDWATER MONITORING

The Discharger shall continue to sample groundwaters as specified in the Comprehensive Hydrology Monitoring Plan as shown in Attachment E. In addition, this monitoring shall include the semi-annual sampling and analysis of the three monitoring wells referenced in Provision No. 10 of Order No. _____. Groundwater monitoring shall include the following:

Constituent	Units	Type of Sample	Sampling Frequency
Elevation	Feet (nearest .01)	Visual	Twice per year ¹
pH	pH Units	Grab	Twice per year ¹
General Minerals ²	mg/L	Grab	Twice per year ¹
Priority Pollutant metals ³	µg/L	Grab	Twice per year ¹
Mercury ⁴	ng/L	Grab	Twice per year ¹

¹ Sampling shall be conducted in June and November of each year, weather permitting.

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- ² General Minerals shall include: Anions – F, Cl, NO₂, NO₃, PO₄, and SO₄ Cations – NH₄, K, Ca, Mg, Na, HCO₃, CO₃, and Al.
- ³ Priority pollutant metals include: Antimony, arsenic, beryllium, cadmium, total chromium, chromium VI, copper, lead, nickel, selenium, silver, thallium, and zinc.
- ⁴ Mercury analyses shall be conducted using the ultraclean protocol, CVAA-EPA Method 1631.

ABOVEGROUND PIPELINE MONITORING

The Discharger shall develop and implement a leak detection program as specified in Provision D.5. of Order No. _____. The Discharger shall inspect the aboveground pipeline daily and maintain a log of the daily inspections including all leaks and spills. Any leak or spill of geothermal fluid in excess of 55 gallons shall be reported the Central Valley Water Board within 24-hours and included in the monthly monitoring report along with the actions taken to repair or eliminate the leaks.

REPORTING

Monitoring reports shall be submitted to the Regional Board by the **first day of the second month** following data collection. Semi-annual monitoring results shall be submitted by the **first day of the second month** following each semi-annual sampling event.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements.

If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

The Discharger may also be requested to submit an annual report to the Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

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All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provisions D.6.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

(Date)

JFR: sae